

The Healthy Immigrant Effect: New Evidence from the Canadian Community Health Survey

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Outline

Background and Motivation

Data and Econometric Model

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What is Healthy Immigrant Effect?

- ▶ Initial health gap:
 - ▶ Selective immigration
 - ▶ Screening process
- ▶ Health convergence:
 - ▶ Acculturation
 - ▶ Barriers to health care access
 - ▶ Under-report health conditions
 - ▶ Selective Emigration

HIE documented in Canada

- ▶ Empirical limitation in using single cross-sectional data (Borjas, 1985)
 - ▶ Not possible to separately identify the effect of years-since-migration from the fixed cohort effects
 - ▶ Cohort effects – composition of immigrants which changes across time due to changes in immigration policies or other externalities.
- ▶ McDonald and Kennedy (2004, 2005) and Armstrong (2006) pool 1996 NPHS and 2000/01 CCHS
- ▶ Armstrong (2004) uses three cycles of NPHS, 1994, 1996, and 1998

So why should we care?

- ▶ Immigrants
 - ▶ Accounted for 20.6% of Canada's population in 2011.
 - ▶ Approximately 200,000 individuals immigrate to Canada annually.
 - ▶ Ease the fiscal burden caused by the growing number of retirees.
- ▶ Deteriorating health of immigrants could undermine the goal of immigration policy.

Research objectives

- ▶ Re-investigating the healthy immigrant effects in Canada using more recent data sets.
 - ▶ Chronic conditions
 - ▶ Overweight and obesity
 - ▶ Self-assessed health status

Why re-investigating HIE: Canada Immigration Policy

- ▶ Partly influence the health quality of immigrants.
- ▶ Recent reforms in immigration policy
 - ▶ Immigration and Refugee Protection Act (IRPA) in 2002
 - ▶ Canadian Experience Class, Ministerial Instructions, Provincial Nominee Program, and Temporary Foreign Worker Program

Why re-investigating HIE: Recent cohorts of immigrants

- ▶ CIC (2010) assesses the IRPA selection system on the economic integration of immigrants.
- ▶ Relative to the pre-IRPA, immigrants who arrived post reform perform better in terms of
 - ▶ Employment rates
 - ▶ Employment earnings
 - ▶ Education
 - ▶ Official language skills

Snapshot of recent immigrants

Variable	Immigrant with YSM ≤ 3					
	2000		2009		2011	
Male						
Income Adequacy Decile	4.43	(3.10)	4.03	(2.90)	4.40	(2.79)
Hold a job	0.79	(0.41)	0.84	(0.37)	0.88	(0.33)
Post-secondary education	0.79	(0.41)	0.77	(0.42)	0.85	(0.35)
Observations	415		386		339	
Female						
Income Adequacy	3.92	(2.87)	3.92	(2.75)	4.12	(2.70)
Hold a job	0.46	(0.50)	0.57	(0.50)	0.55	(0.50)
Post-secondary education	0.68	(0.47)	0.81	(0.39)	0.81	(0.40)
Observations	376		452		403	

s.e. in parentheses

Data source: CCHS 2000, 2009, and 2011

Re-investigating the HIE

Given that:

- ▶ Newer cohorts of immigrant are relatively more economically successful
- ▶ Positive relationship between income and health

- ▶ I expect the initial health gap between immigrant and native-born population to be even larger.
- ▶ First study to re-investigate the presence of HIE using a new data that encompasses immigrants who arrived after the more recent changes in immigration policies.

Re-investigating the HIE

- ▶ Replicating McDonald and Kennedy (2004) - NPHS 1996 and CCHS 2000
 - ▶ CCHS 2007 and CCHS 2011
- ▶ I find that healthy immigrant effect is no longer present.
- ▶ Evidence of health divergence

- ▶ Compare health differences between recent immigrants across calendar year
 - ▶ Matching method
 - ▶ Recent immigrants in 2000 as a benchmark
 - ▶ Analysis is done for recent immigrants in 2009 and 2011

Extension - Measurement errors

- ▶ How measurement errors could play some role in explaining the healthy immigrant effect found in previous literature.

CCHS

- ▶ Canadian Community Health Survey (CCHS) 2007 and 2011
- ▶ Age 20 to 65 during the time of the interview
- ▶ Excluded all individuals living in the three territories: Northwest Territories, Yukon, and Nunavut
- ▶ Excluded pregnant women and students
- ▶ The final sample pooled size is 20,053 males and 22,881 females

Health outcomes

1. The incidence of type A chronic conditions
 - ▶ Asthma, back pain, high blood pressure, allergies, migraines, ulcers, bronchitis, and arthritis.
2. The incidence of type B chronic conditions
 - ▶ Heart disease, cancer, thyroid disease, Crohn's disease, and diabetes.
3. The likelihood of being overweight or obese (BMI greater than or equal to 25)
4. The probability of reporting having poor or fair health (self-assessed health status)

Basic specification: Mcdonald and Kennedy (2004)

$$\begin{aligned}
 Y_i = & \alpha_0 + \alpha_1 \text{age}_i + \alpha_2 \text{age}_i^2 + \sum_{j=1}^{J-1} \delta_0 A_{ij} \text{age} + \sum_{j=1}^{J-1} \delta_1 A_{ij} \text{age}^2 + X_i \delta_2 + \beta_0 \text{IMM}_i + \beta_1 \text{YSM}_i \\
 & + \beta_2 \text{YSM}_i^2 + \sum_{k=1}^{K-1} \lambda_k C_{ik} + \theta_0 \text{cycle}_i + \theta_1 \text{cycle}_i * \text{age}_i + \theta_2 \text{cycle}_i * \text{age}_i^2 + \epsilon_i \quad (1)
 \end{aligned}$$

- Included in the vector of X are education, indicator for having an English or French language mother-tongue, marital status, province of residence, indicator for living in an urban area (versus rural area), indicator if there is a child less than 12 years old in the household, proxies for income, and ethnicity.

Controlling for the cohort effects

	Type A Incidence		Type B Incidence		Overweight/obese		Poor/fair health	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Male:								
Immigrant	-0.776 (0.753)	-0.3241 (0.335)	0.131 (0.991)	-0.5084 (0.472)	0.214 (0.765)	n.a.	1.566 (1.048)	-0.3975 (0.411)
YSM	0.0696* (0.028)	0.0143 (0.020)	-0.0230 (0.036)	0.0179 (0.028)	-0.0299 (0.0277)	n.a.	-0.0412 (0.040)	-0.0094 (0.024)
YSM-squared	-0.0010** (0.000)	-0.0001 (0.000)	0.0003 (0.000)	0.0001 (0.000)	0.0005 (0.000)	n.a.	0.0002 (0.000)	0.0007 [†] (0.000)
Female:								
Immigrant	-0.463 (0.751)	-0.5714 [†] (0.301)	0.314 (1.129)	-0.8674* (0.378)	-0.698 (0.728)	n.a.	1.294 (1.004)	-0.0756 (0.458)
YSM	0.0177 (0.028)	0.0367* (0.018)	-0.0185 (0.042)	0.0560* (0.023)	0.0331 (0.027)	n.a.	-0.0229 (0.039)	0.0259 (0.026)
YSM-squared	-0.0003 (0.000)	-0.0006* (0.000)	0.0002 (0.000)	-0.0009* (0.000)	-0.0004 (0.000)	n.a.	-0.0000 (0.000)	-0.0007 (0.000)

s.e. in parentheses

Note:(1) Duangsuda (2014); (2) McDonald and Kennedy (2004)

Source:(1) CCHS 2007 and 2011; (2) NPHS 1996 and CCHS 2000/01

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Matching method

- ▶ Propensity score estimation is done using Logit model
- ▶ Matching algorithm used is nearest-neighbour
- ▶ Matching covariates are age, ethnicity, education, income status, marital status, and gender
- ▶ Average Treatment Effect

Matching result

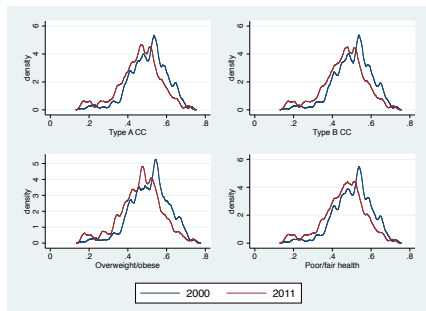
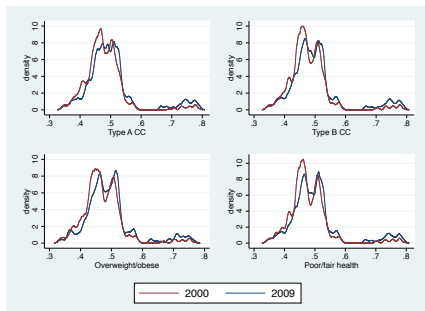
	2000 vs 2009	2000 vs 2011
Type A CC	0.0062 (0.026)	-0.0190 (0.026)
Type B CC	0.0089 (0.012)	-0.0038 (0.012)
Overweight/obese	0.0709* (0.030)	0.0740* (0.031)
Poor/fair health	-0.0039 (0.014)	-0.0015 (0.011)

s.e. in parentheses

[†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Data source: CCHS 2000, 2009, and 2011

Validity of matching estimator: Overlap assumption



Validity of matching estimator: Covariates balance

Variable	2000 vs 2009	2000 vs 2011
Age	0.373	0.662
Ethnic-White	0.667	0.499
Ethnic-Asian	0.958	0.506
Ethnic-Others	1.000	0.218
Post-secondary degree	0.121	0.026
Married	0.093	0.368
Male	0.397	0.474
Household income distribution	0.563	0.942

Data source: CCHS 2000, 2009, and 2011

Validity of matching estimator: Sensitivity analysis

	Gamma (Γ)									
	1		1.25		1.5		1.75		2	
2000 VS 2009										
Type A CC	0.819	(0.206)	2.1147	(0.017)	3.180	(0.000)	4.091	(0.000)	4.888	(0.000)
Type B CC	-0.081	(0.532)	0.487	(0.312)	0.956	(0.169)	1.358	(0.087)	1.712	(0.043)
Overweight/obese	1.650	(0.049)	3.080	(0.001)	4.255	(0.000)	5.256	(0.000)	6.131	(0.000)
Poor/fair health	0.130	(0.448)	0.203	(0.419)	0.749	(0.226)	1.215	(0.112)	1.624	(0.052)
2000 VS 2011										
Type A CC	0.708	(0.239)	2.011	(0.022)	3.083	(0.001)	3.998	(0.000)	4.799	(0.000)
Type B CC	-0.147	(0.558)	0.341	(0.366)	0.816	(0.207)	1.223	(0.110)	1.580	(0.056)
Overweight/obese	1.992	(0.023)	3.427	(0.000)	4.608	(0.000)	5.615	(0.000)	6.496	(0.000)
Poor/fair health	0.230	(0.408)	0.801	(0.211)	1.274	(0.101)	1.681	(0.046)	2.040	(0.020)

ρ^+ p -value in parentheses

Measurement errors and healthy immigrant effect

- ▶ Self-reporting measurements of health are subjected to measurement error.
- ▶ Misreporting weight and height lead to imprecise measure of probability of overweight and obese.
- ▶ Data: Canadian Health Measure Survey cycle 1 and 2
 - ▶ Telephone interview
 - ▶ Physical measures at a mobile examination centre

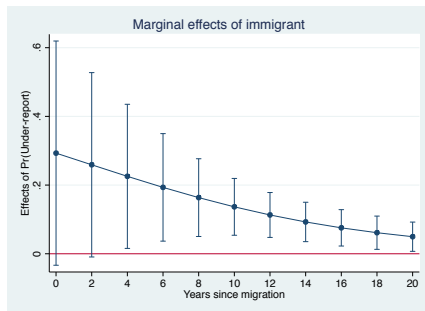
Measurement errors and healthy immigrant effect

- ▶ Similar specification and sample restrictions as before
- ▶ Outcome of interest: Inconsistency between the self-identified overweight or obesity and the clinically measured overweight or obesity.
 - ▶ “probability of under-reporting overweight or obesity”
- ▶ The final sample size is 4,962
- ▶ The estimation is done with probit model

Results from probit regression

	Selected Coefficient	s.e.
Immigrant	1.3831**	(0.526)
YSM	-0.0950 [†]	(0.057)
YSM-squared	0.0012 [†]	(0.001)
<i>F</i> -test immigrant and cohort dummies p-value		0.0254
<i>F</i> -test immigrant, cohorts and YSMs p-value		0.0411
Data source: CHMS cycle 1 and 2		
[†] $p < 0.10$ * $p < 0.05$, ** $p < 0.01$		

Marginal effects of being immigrant



- ▶ Immigrants are more likely to misreport their health upon arrival
- ▶ The probability of misreport declines over years since migration
- ▶ Healthy immigrant effect may not be as strong as previously found

Conclusion

- ▶ Healthy immigrant effect is no longer observed using the new data set.
- ▶ Health divergence among immigrant men in terms of Type A chronic condition.
- ▶ More recent cohorts of immigrants have better socio-economic outcomes, but are more likely to face health risks of being overweight or obese.
- ▶ Healthy immigrant effect is partially driven by misreports among immigrant population.

THANK YOU !